

CLAIMS

We Claim:

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1. A method of sealing an opening in a vessel bottom, comprising the steps of:

(a) providing a vessel having a bottom, an opening in the vessel bottom, and a first wall surrounding the opening;

10 (b) providing a door having a sealing wall, the sealing wall having a contact face and a back face on the opposite side of the sealing wall from the contact face;

(c) advancing the door towards the opening, causing the contact face of the sealing wall to contact the first wall; and

(d) moving a reinforcing member into contact with the back face, thereby reinforcing contact between the contact face and the first wall.

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2. The method of claim 1 wherein the first wall is a flanged wall.

3. The method of claim 2 wherein the sealing wall is a flanged wall.

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4. The method of claim 1 wherein the reinforcing member includes an o-ring, and wherein step (d) includes moving the o-ring into contact with the back face.

5. The method of claim 4, wherein step (d) further includes advancing a wedge to move the o-ring into contact with the back face.

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6. The method of claim 5, wherein:

step (b) further provides a stiffening beam slidably disposed on the door, wherein the wedge is connected to the stiffening beam; and

30 step (d) includes sliding the stiffening beam relative to the door to move the wedge into contact with the o-ring.

7. The method of claim 1 wherein the vessel is a process vessel for use in exposing semiconductor substrates to process fluids.

8. The method of claim 7, wherein the door is a dump door for use in rapidly draining fluids from the process vessel.

9. The method of claim 1, wherein the method is further for exposing an object to a treatment fluid, and wherein the method further includes the steps of:

(e) after step (d), at least partially filling the vessel with a treatment fluid;

10 (f) exposing the object to treatment fluid within the vessel; and

(g) withdrawing the door from the opening to rapidly drain treatment fluid from the vessel.

10 15 10. The method of claim 1, wherein the method is further for exposing an object to a treatment fluid, and wherein the method further includes the steps of:

providing a fluid manifold in the door;

after step (d), flowing treatment fluid through the fluid manifold to at least partially fill the vessel with treatment fluid; and

exposing the object to treatment fluid within the vessel.

20 11. The method of claim 10, further comprising the step of withdrawing the door from the opening to rapidly drain treatment fluid from the vessel.

12. A vessel and compliant door assembly, comprising:

25 a vessel having a bottom, an opening in the vessel bottom, and a first wall surrounding the opening;

a door having a sealing wall, the sealing wall having a contact face moveable into contact with the first wall, and a back face on the opposite side of the sealing wall from the contact face; and

30 a reinforcing member moveable into contact with the back face, thereby reinforcing contact between the contact face and the first wall.

13. The assembly of claim 12 wherein the first wall is a flanged wall.

14. The assembly of claim 13 wherein the sealing wall is a flanged wall.

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15. The assembly of claim 12 wherein the reinforcing member includes an o-ring moveable into contact with the back face.

16. The assembly of claim 15, further including a wedge moveable against the o-ring to move the o-ring into contact with the back face.

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17. The assembly of claim 16, further including a stiffening beam slidably disposed on the door, wherein the wedge is connected to the stiffening beam and wherein the stiffening beam is slidable relative to the door to move the wedge against the o-ring.

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18. The assembly of claim 12 wherein the vessel is a process vessel for use in exposing semiconductor substrates to process fluids.

19. The assembly of claim 18, wherein the door is a dump door for use in rapidly draining fluids from the process vessel.

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20. The assembly of claim 12, wherein the vessel is for use in exposing an object to a treatment fluid, and wherein the dump door is moveable away from the opening to rapidly drain treatment fluid from the vessel.

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21. The assembly of claim 12, further including a fluid manifold in the door.

22. A vessel and compliant door assembly, comprising:

a vessel having a bottom, an opening in the vessel bottom, and a first wall

30 surrounding the opening;

a door having a sealing wall, the sealing wall having a contact face moveable into contact with the first wall, and a back face on the opposite side of the sealing wall from the contact face, the sealing wall conformable with the first wall when advanced into contact with the first wall; and

5 a reinforcing member in contact with a portion of the back face, thereby reinforcing contact between the contact face and the first wall.

23. The assembly of claim 22 further including a stiffening member fixed to the door.

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24. The assembly of claim 22 wherein the sealing wall is a flanged wall.

25. The assembly of claim 22 wherein the reinforcing member includes an o-ring in contact with the back face.

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26. The assembly of claim 25, including a stiffening member fixed to the door, wherein the o-ring is disposed between the stiffening member and the back face.

27. The assembly of claim 22, further including a fluid manifold in the door.

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